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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Kim DAM LARSEN, Peter RASMUSSEN, Attn: PCT Branch
Uffe DAM LARSEN

Application No. US National Stage of PCT/DK00/00054

Filed: July 23, 2001

Docket No.: 110171

For: AN ELECTRIC MULTIPOLE MOTOR/GENERATOR WITH AXIAL
MAGNETIC FLUX

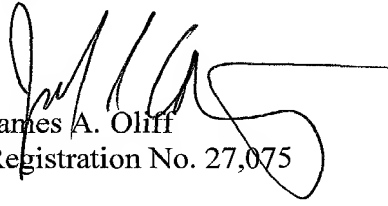
**SUBMISSION OF THE ANNEXES TO THE
INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

Director of the U.S. Patent and Trademark Office
Washington, D.C. 20231

Sir:

Attached hereto are the annexes to the International Preliminary Examination
Report (Form PCT/IPEA/409). The attached material replaces claims 1-40.

Respectfully submitted,


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Amended Claims:

1. An electrical machine comprising:

5 a rotor secured to a shaft with an axis of rotation,
said rotor comprising a plurality of magnets or means for
producing a magnetic field,

a stator with air gaps formed between the rotor and
the stator, said stator comprising a plurality of
separate pole cores having corresponding separate coils
10 or set of windings wound on and surrounding said pole
cores, said pole cores being arranged so that at least a
portion of one or more of the pole cores is arranged at
an angle to the axis of rotation, said angle being equal
to or greater than 0 degrees and below 90 degrees, and
15 said pole cores providing part(s) of one or more magnetic
flux paths,

wherein a magnetic flux path includes two and only
two pole cores and two and only two air gaps.

20 2. An electrical machine according to claim 1, wherein
the plurality of magnets or means for producing a
magnetic field are arranged in pairs having poles of
similar polarity facing each other.

25 3. An electrical machine comprising:

a rotor secured to a shaft with an axis of rotation,
said rotor comprising a plurality of magnets or means for
producing a magnetic field,

a stator with air gaps formed between the rotor and
30 the stator, said stator comprising a plurality of
separate pole cores having corresponding separate coils
or set of windings wound on and surrounding said pole

cores, said pole cores being arranged so that at least a portion of one or more of the pole cores is arranged at an angle to the axis of rotation, said angle being equal to or greater than 0 degrees and below 90 degrees, and
5 said pole cores providing part(s) of one or more magnetic flux paths,

wherein the plurality of magnets or means for producing a magnetic field are arranged in pairs having poles of similar polarity facing each other.

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4. An electrical machine according to claim 3, wherein a magnetic flux path includes flux paths through two pole cores.

15 5. An electrical machine according to claim 4, wherein a magnetic flux path includes two and only two pole cores and two and only two air gaps.

20 6. An electrical machine according to any one of the claims 1-5, wherein each separate pole core has a corresponding separate coil or set of windings.

25 7. An electrical machine according to any one of the claims 1-6, wherein the rotor is arranged so that at least part of the rotor is substantially perpendicular to the axis of rotation

30 8. An electrical machine according to any one of the claims 1-7, wherein the angle is equal to or below 45 degrees.

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9. An electrical machine according to any one of the claims 1-8, wherein the angle is equal to or below 30 degrees.
- 5 10. An electrical machine according to any one of the claims 1-9, wherein at least a portion of one or more of the pole cores is substantially parallel to the axis of rotation.
- 10 11. An electrical machine according to claim 10, wherein one or more windings or coils have their axis substantially parallel to the axis of rotation.
12. An electrical machine according to any one of the claims 1-11, wherein one or more pole cores have a portion arranged substantially perpendicular to the axis of rotation of the shaft.
- 15 13. An electrical machine according to claim 12, wherein one or more windings or coils have their axis substantially perpendicular to the axis of rotation.
- 20 14. An electrical machine according to any one of the preceding claims, wherein the rotor is circular.
- 25 15. An electrical machine according to any one of the claims 1-14, wherein the stator further comprises a magnetic conductive end plate connected to said pole legs or cores.

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AMENDED SHEET

16. An electrical machine according to claim 15, wherein the end plate is arranged substantially parallel and opposite to the rotor.
- 5 17. An electrical machine according to any one of the claims 1-16, wherein the number of pole cores equals the number of magnets or means for producing a magnetic field.
- 10 18. An electrical machine according to any one of the preceding claims, wherein the magnets or means for producing a magnetic field are located radially and equidistantly in the rotor.
- 15 19. An electrical machine according to any one of the preceding claims, wherein the magnets or means for producing a magnetic field are located on one side of the rotor facing ends of the pole cores.
- 20 20. An electrical machine according to any one of the claims 1-18, wherein the magnets or means for producing a magnetic field are located on the outer periphery of the rotor.
- 25 21. An electrical machine according to claim 18, wherein pole shoes are arranged between the magnets or means for producing a magnetic field.
- 30 22. An electrical machine according to any one of the preceding claims, wherein magnets or means for producing a magnetic field are arranged on the rotor to fit substantially into a V-shape.

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23. An electrical machine according to claim 22, wherein the magnets or the means for producing a magnetic field are arranged in pairs to obtain said V-shape.

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24. An electrical machine according to any one of the preceding claims, wherein the machine is a synchronous one phase machine.

10 25. An electrical machine according to any one of the preceding claims, wherein the magnets or means for producing a magnetic field are permanent magnets.

15 26. An electrical machine according to any one of the claims 1-25, wherein the magnets or means for producing a magnetic field are electromagnets.

20 27. An electrical machine according to any one of the preceding claims, wherein a winding or coil is formed by a flat concentrated coil.

25 28. An electrical machine according to any one of the preceding claims, wherein the pole cores are assembled of a magnetic conducting material.

29. An electrical machine according to claim 28, wherein the magnetic conducting material is a field oriented soft magnetic lamination.

30 30. An electrical machine according to any one of the preceding claims, wherein the machine is a generator which may be provided with a mechanical force/power via

said shaft to generate an electrical power via said windings.

31. An electrical machine according to claim 30, wherein
5 said machine is used in a wind turbine.

32. A multiphase machine, wherein a number of phases is
obtained by arranging a corresponding number of one phase
machines according to any one of the claims 24-31 in se-
10 ries.

33. An electrical machine according to claim 22, wherein
the magnets or means for producing a magnetic field are
arranged on the rotor to fit substantially into two or
15 more V-shapes.

34. An electrical machine according to claim 33, wherein
each V-shape comprises a pair of magnets or means for
producing a magnetic field.

20 35. An electrical machine according to any one of the
claims 1-11, wherein the pole cores are formed by U-
shaped elements, said elements being arranged in the
stator so that one pole core is formed by two adjacent
25 legs of two U-shaped elements.

36. An electrical machine according to claim 35, wherein
a magnetic flux path is going through two pole cores and
having its path in both legs of one U-shaped pole core
30 element.

37. An electrical machine according to any one of the preceding claims, wherein the pole cores are made of a magnetic conducting material, and wherein the pole cores are arranged on a stator plate made of a material having
5 a low magnetic conductivity.

38. An electrical machine according to any one of the preceding claims, wherein the width of a pole core is substantially equal to the distance between two
10 successive pole cores.

39. An electrical machine according to claim 21, wherein the width of a pole shoe at the outer periphery of the rotor is substantially equal to the width of a pole core
15 oppositely arranged in the stator.

40. An electrical machine according to any one of the preceding, wherein a first stator is arranged opposite to and facing a first side of the rotor, and a second stator
20 is arranged opposite to and facing the other side of the rotor.